

PROCEEDINGS OF THE  
ENTOMOLOGICAL SOCIETY OF WASHINGTON

VOL. 48

MARCH, 1946

No. 3

ON EUPLILOIDES, AN ORIENTAL SUBGENUS OF CROSSOCERUS  
(Hymenoptera: Sphecidae: Pemphilidini)

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The large and complex pemphilidine genus *Crossocerus* is divisible into a large number of subgenera, as I have recently demonstrated.<sup>1</sup> The collection of the United States National Museum, which I have recently had the privilege of studying, contains several Oriental and Oceanic species that superficially resemble those referable to the Oriental subgenus *Apocrabro*, but these forms differ from *Apocrabro* in a number of striking features and require a new subgenus for their reception. A review of this new subgenus is presented herewith.

**EUPLILOIDES**, new subgenus

*Rhopalum* Ashmead (nec Kirby), U. S. Natl. Mus. Proc. 28: 130, 150, 1904;  
Brown, Philippine Jour. Sci. 1: 687, 1906.

GENOTYPE: *Rhopalum albocollare* Ashmead, 1904 [= *Crossocerus (Eupliloides) albocollaris* (Ashmead)].

The superficial habitus of the present group is similar to that of *Euplilis*, but the sharply carinate prepectus, the simple, obterete hind tibiae, and the four-segmented labial and six-segmented maxillary palpi indicate at once that the component species cannot be assigned to that genus. Like the members of the recently described Oriental complex *Apocrabro*, the species of *Eupliloides* have the abdomen petiolate, the mandibular apices evenly bidentate in both sexes, and the occipital carina terminating below in a spine or tubercle in the female sex. However, the sharply carinate anterior margin of the mesosternum, the clavate antennal scapes, and the long anal lobe of the hind wing readily distinguish *Eupliloides* from *Apocrabro*. Moreover, the first abdominal segment of *Apocrabro* is gradually ampliate toward the apex and perfectly sessile with the second segment, whereas in *Eupliloides* the petiole is very slender, elongate and cylindrical, abruptly nodose at apex, and separated by a strong constriction from the remainder of the fusiform

<sup>1</sup> Lloydia 6: 257-317, 1943 [1944].

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abdomen. The absence of a pygidial area on the last abdominal tergite of the female is a unique characteristic of the present group and immediately differentiates *Eupliloides* from all other subgenera of *Crossocerus*.

*Diagnostic features.*—Small, slender, elongate, fulgid, impunctate, or at most finely punctate, forms with petiolate abdomen. Head somewhat broader than thorax; subquadrate to transversely subrectangular in both anterior and dorsal aspects; malar space wanting. Eyes very large, naked, inner orbits arcuate and very broad below in anterior aspect; very coarsely faceted anteriorly, finely so posteriorly. Front very narrow, shallowly concave, glabrous and nitidous on anterior vertical aspect between inner orbits; unarmed medially below; upper horizontal portion of front flat, on same plane as vertex, bisected by a deep impression running forward from anterior ocellus to the immarginate scapal sinus. Vertex flat, simple; supraorbital foveae absent; ocelli rather large, arranged in an equilateral triangle, the ocellocular line always much longer than the postocellar line; occipital carina well developed, more or less flanged, not a complete circle in extent, curving forward beneath toward, but not attaining, the posterior mandibular condyles, and terminating in a small tooth or tubercle; oral fossa transversely subelliptical, the hypostomal carinule well developed, more or less flanged, with a small lobe or protuberance on midventral line, but without lateral arcuate carinules to the inframandibular lobe as in *Apocrabro*. Temples moderate, simple, ecarinate. Antennae with scapes slender, straight, elongate-cylindrical, weakly clavate on apical third, ecarinate; pedicel subarcuate; flagellum simple in both sexes, and without a fringe of hairs beneath in males. Clypeus transversely linear laterally, with a short median lobe which is denticulate or crenulate apically. Maxillary palpi with six segments; labial palpi with four segments; prementum bisected by a trenchant keel or sharp carina. Mandibles slender, elongate; apices evenly bidentate in both sexes; lower margins entire; inner margins edentate. Females without a psammophore.

Thorax narrower than head, more or less fulgid; dorsum and pleura impunctate or finely punctate at most. Pronotum short, transverse, situated almost on same level as mesonotum, not notched medially nor sharply carinate anteriorly. Mesonotum simple; axillae oblique, linear, with lateral edges bluntly margined; suture between mesonotum and scutellum broadly, deeply impressed and foveate; scutellum and postscutellum simple, the areas laterad of each deeply excavate. Propleura simple, not produced into a stout tuberculoid process at lower outer angles. Mesopleura with prepectus very sharply margined anteriorly; simple or armed with a small tubercle before middle coxae; episternal suture distinct, foveate; mesopleural pit small but distinct; lacking any indication of episternauli, mesopleurauli, hypersternauli, or sternauli. Mesosternum sharply carinate anteriorly. Propodeum nitidous, without appreciable sculpture; dorsal face without a defined trigonal enclosure but bisected by a sulcus which terminates in the deep furrow bisecting posterior face; lateral carinae present but developed only along lateral margins of posterior face, simple below.

Legs simple, slender, elongate in both sexes. All tarsi simple, but last seg-

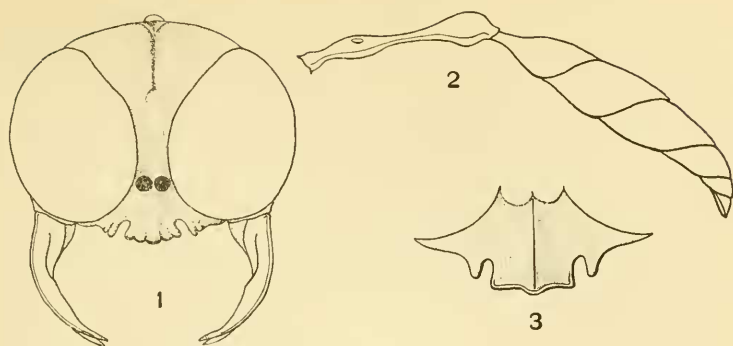


Fig. 1.—*Crossocerus (Eupliloïdes) bougainvilleae*, n. sp.: Anterior aspect of head; Fig. 2.—*Crossocerus (Eupliloïdes) leontopolites*, n. sp.: Lateral aspect of abdomen; Fig. 3.—*Crossocerus (Eupliloïdes) leontopolites*, n. sp.: Anterior aspect of clypeus.

ment large and swollen in both sexes; females without a distinct pecten on fore metatarsi. Both sexes with an apical calcar on middle tibiae, and with hind tibiae simple, obterate. Hind coxae simple, edentate beneath in males.

Forewings with marginal cell three times as long as wide, and broadly, squarely truncate at apex; radial vein with first abscissa six-tenths the length of second abscissa; transverse cubital vein straight, oblique, inclivous, one-half the length of second abscissa of cubitus which is subequal in length to the first abscissa of cubitus. Hind wing with anal lobe large, elongate-ovate, well separated off and as long as to slightly longer than the short submedian cell.

Abdomen slender, elongate, impunctate. First segment petioliform, twice the length of the second segment, slenderly subcylindrical, constricted medially, without lateral carinae, the spiracles situated one-third of the way from base, strongly nodose at apex and separated by a very strong constriction from the remainder of the slender, fusiform abdomen, which is somewhat depressed in males. Basal acarid chambers present on fourth and fifth tergites. Females with last segment conical, without a pygidial area. Males without a pygidial area on subtrigonal last tergite, the puncturation of which is no coarser than that of penult tergite; apical tergites and sternites simple, without processes; hypopygium simple, flat, apex bluntly rounded, and armed with two curved bristles.

*Ethology.*—The species of *Eupliloïdes* are probably xylocetes or rubicoles and thus are referable to the *Dryocrossocerotus* division of the genus *Crossocerus*. The conical abdominal apex is very similar to that of *Trypoxylon* and may indicate that the members of *Eupliloïdes* nest in pre-existing cavities like the abandoned holes of wood-boring beetles or the interior of straws and grasses. The badly worn-down mandibles of a female *albocollaris* from Manila denote that the mandibles must be used to a certain extent in nest construction. The sting of these wasps is strongly recurved, and this is presumptive evi-

dence that the prey, probably nematoceros Diptera, is carried impaled on the sting, much as it is in *Oxybelus* and certain other pemphilid wasps.

*Distribution.*—The species of *Eupliloides* inhabit the tropical forest areas of the Orient and Oceania. The complex ranges from the Philippines southward to the Straits Settlements in Malaya and thence eastward through Sundaland and the Papuan region to the Solomon Islands. Many forms doubtless occur throughout this area, but at present only four are known which may be definitely assigned to *Eupliloides*. The subjoined key will serve to differentiate these.

#### KEY TO FORMS OF EUPLILOIDES

1. Clypeal lobe armed medio-apically with a porrect spine or tubercle; mesopleura with a fine, short carinule running forward from just above middle coxae and terminating in a small tubercle..... 2  
Clypeal lobe simple, unarmed medio-apically..... 3
2. Mesonotum bisected on anterior half by a deep, broad furrow; clypeus with medio-apical prominence low, strongly compressed, tuberculoid. (Palawan)..... *alvocollaris princesa*, new subspecies  
Mesonotum not deeply furrowed, at most with only a weak shallow sulcus on anterior half; clypeus with medio-apical prominence large, porrect, spinoid. (Luzon)..... *alvocollaris alvocollaris* (Ashmead)
3. Pronotum with humeral angles rounded; mesopleura with a fine, short carinule running forward from just above middle coxae and terminating in a small tubercle; pronotum, axillae and scutellum stramineous. (Singapore)..... *leontopolites*, new species  
Pronotum with humeral angles armed with a small spine; mesopleura simple, unarmed before middle coxae; immaculate black forms. (Solomon Islands)..... *bougainvilleae*, new species

#### *Crossocerus* (*Eupliloides*) *alvocollaris alvocollaris* (Ashmead)

*Rhopalum alvocollare* Ashmead, 1904, U. S. Natl. Mus. Proc. 28: 130 [♀ (recte ♂): Manila, Luzon]—Brown, 1906, Philippine Jour. Sci. 1: 687.

*Type.*—Male; Observatory Garden, Manila, Luzon, Philippine Islands. (W. A. Stanton.) [United States National Museum, Catalogue No. 7995.]

The armed clypeus, tuberculate mesopleura, and rounded edentate pronotal humeri distinguish this Philippine Islands species from all other known forms of *Eupliloides*.

Ashmead in his original description of *alvocollare* stated that the species was based upon a female, but an examination of the type in the United States National Museum reveals it to be a male.

Both sexes of the typical race of *alvocollaris* have the clypeal lobe armed medio-apically with a large porrect spinoid process,

which serves as an excellent recognition character for the species. The apical margin of the clypeal lobe is tridentate in the male and quinquedentate in the female. Both sexes have the mesonotum flat or at most weakly sulcate medio-anteriorly, and the dorsal face of the propodeum bisected by a very narrow immarginate groove.

*Specimens examined*.—One male, 2 females, as follows:

Luzon: Observatory Garden, Manila (W. A. Stanton): 1 male [type]. Manila (Robert Brown): 1 female. Mt. Makiling (C. F. Baker): 1 female. [All U. S. N. M.]

In Palawan, *albocollaris* is represented by the following distinctive race:

***Crossocerus (Eupliloides) albocollaris princesa*, new subspecies**

The strongly sulcate mesonotum and small tuberculoid prominence on the apex of the clypeal lobe differentiate the Palawan subspecies *princesa* from the nominate race of *albocollaris* on Luzon.

*Type*.—Female; Puerta Princesa, Palawan, Philippine Islands. (C. F. Baker.) [United States National Museum, Catalogue No. 57655.]

*Female*.—Length, 5 mm. Similar to the typical form except in the following noteworthy features:

Livery: perfulgid black. The following stramineous: antennal scapes with a stripe lengthwise anteriorly, pronotum broadly interrupted medially, axillae, scutellum laterally, postscutellum, middle tibiae with a small spot near base, hind tibiae widely annulate at base, middle and hind metatarsi medially above. Fulvous: mandibles save red apices, palpi, scapes, fore tibiae, and all tarsi. Dark castaneous: antennal flagellum, tegulae, axillary sclerites; veins and stigma of wings.

Head with clypeal prominence low, strongly compressed, tuberculoid.

Thorax with mesonotum with a relatively wide and deep rounded sulcus on anterior half. Propodeum with dorsal face bisected by a wide, shallow, submarginate groove or furrow.

This form is known at present from only the unique female described above.

***Crossocerus (Eupliloides) leontopolites*,<sup>2</sup> new species**

The present species is somewhat intermediate in character between the preceding and following forms, agreeing with *albocollaris* in the maculated pronotum, axillae, and scutellum, the rounded humeral angles of the pronotum, and the spined mesopleura; and with *bougainvilleae* in the simple, nontuberculate clypeal lobe.

<sup>2</sup> *λεοντοπολιτης* "dweller in the City of the Lion," i. e., Singapore.

*Type*.—Male; Singapore, Straits Settlements. (C. F. Baker.)  
[United States National Museum, Catalogue No. 57656.]

*Male*.—Length, 5 mm. Perfulgid; head and apical five segments of abdomen black; thorax, legs, and first two abdominal segments very dark castaneous. Following stramineous: pronotum dorsally except for a brief interruption medially, axillae, scutellum, and middle and hind tibiae broadly annulate at base. Fulvous: mandibles save for red apices, palpi, antennae, and forelegs. Wings clear hyaline; veins and stigma dark castaneous.

Head perfulgid; clypeus with moderate vestiture of appressed silvery pubescence; front glabrous; vertex with a very thin and sparse clothing of erect hairs; temples thinly clad with light decumbent hairs. Front very narrow, shallowly concave, polite, impunctate; frontal impression moderately deep; vertex perfulgid, impunctate save for sparse and fine, scattered, setigerous acupunctures; ocellular line twice the postocellar distance; post-temporal and gular regions nitidous; occipital carina well developed, very finely foveolate anteriorly, curving forward below but not ending in a distinct spine or tubercle. Antennae with scapes elongate, gently clavate apically, about one-half (0.53) the vertical eye length; pedicel suborbate, subequal in length to first flagellar article; flagellum with first two segments subequal in length, ultimate article simple, obterate, one and a half times the length of the penult segment. Clypeus with median length one-fourth the vertical eye length; flat, bisected by a low carinule; median length one-fourth the vertical eye length; flat, bisected by a low carinule median lobe with apical width about one and a quarter (1.23) the median clypeal length, simple and unarmed medio-apically, apical margin truncate and with a small median tooth, laterally on each side of lobe with a large strong tooth.

Thorax perfulgid; dorsally with a thin clothing of long, erect, light hair, pleura with a more noticeable vestiture of decumbent silvery pubescence. Pronotum impunctate; flat, ecarinate anteriorly, humeri bluntly rounded. Mesonotum polite, impunctate, bisected on anterior two-thirds by a broad, rounded, moderately deep furrow; suture between mesonotum and scutellum broadly, deeply impressed, coarsely foveate; axillae oblique, linear, lateral edges bluntly margined; scutellum and postscutellum flat, polite, impunctate; suture between scutellum and postscutellum deeply impressed, coarsely foveolate. Mesopleura nitidous, impunctate save for minute setigerous acupunctures; episternal suture impressed, foveate; with a fine, short horizontal carinule running forward from just above articulation of middle coxae and ending in a small tubercle. Metapleura glabrous, polite. Propodeum polite, impunctate, glabrous; dorsal face bisected by a narrow submarginate groove which passes into the broad, deep, immarginate sulcus bisecting posterior face which is finely rugulose in valvular region.

Legs with femora thinly clad with rather long, suberect hair; tibiae with more noticeable decumbent silvery pubescence; tarsi hairy. Longer hind tibial calcar two-thirds length of hind metatarsi.

Abdomen fulgid; first two segments polite, glabrous, impunctate; remaining segments with a very thin vestiture of short, decumbent, subaeneous hair. Sternites impunctate; sixth with caudal margin broadly, shallowly excised;

seventh with a small, low and weak tubercle on each side of median line; hypopygium elongate, flat, broadly rounded at apex, each latero-apical corner armed with a stout curved bristle.

*Female*.—Unknown.

In addition to the type, I have examined three topotypic males (paratypes) which agree with the type in all essential features of livery and structural detail.

**Crossocerus (Eupliloides) bougainvilleae**, new species

The immaculate black habitus, dentate pronotal humeri, and simple unarmed clypeus and mesopleura readily differentiate this large and handsome Solomon Islands species from the other known forms of *Eupliloides*.

*Type*.—Female; Bougainville Island, Solomon Islands. July 1 to September 15, 1944. (Ashley Buell Gurney.) [United States National Museum, Catalogue No. 57657.]

*Female*.—Length, 7 mm. Fulgid black. Eburneous: metatarsi above, and all tibiae narrowly annulate at base. Fulvous: Mandibles, palpi, antennal scapes, and first four tarsal segments. Wings clear hyaline, iridescent; veins and stigma black.

Head perfulgid; clypeus clothed with appressed silvery pubescence; front along inner orbits and above with a thin vestiture of short silvery hair; vertex sparsely clad with rather long, suberect dark hair; temples with decumbent silvery pubescence. Front very narrow, strongly concave between inner orbits, with fine setigerous acupuncturation laterally and above; frontal impression strong and deep; vertex with scattered, fine, setigerous acupunctures; ocellular line twice the postocellar distance; occipital carina well developed, finely foveolate anteriorly, terminating below in a strong tubercle. Antennae with scapes slender, elongate-cylindrical, gently clavate apically, five-ninths (0.55) the vertical eye length; pedicel suborbate, about seven-tenths (0.718) the length of first flagellar article; flagellum with second segment almost seven-eighths (0.856) the length of first, the third five-sixths (0.83) the length of second, penult article two-thirds the length of simple, obterete last segment. Clypeus with median length one-fifth the vertical eye length; flat laterally to weakly tectate (but not carinate) discally; median lobe with apical width one and three-tenths the median clypeal length, apical margin quinque-crenulate, the median tooth the largest, not armed medio-apically with a porrect spine or tubercle, laterad of lobe on each side with a blunt bidenticulate process. Mandibles elongate; lower margins and inner faces with elongate setae.

Thorax perfulgid; dorsally with a thin vestiture of erect subaeneous hair; pleura more noticeably clad with decumbent silvery hair. Pronotum with dorsal surface flat, posterior margin weakly impressed, each humeral angle with a sharp spinoid tubercle behind which is another small blunt one. Mesonotum with sparse and scattered, fine, setigerous acupunctures, the anterior half bisected by a very broad and shallow furrow; suture between mesonotum and scutellum broadly, deeply impressed and coarsely foveate; axillae oblique,

linear, lateral edges bluntly margined; scutellum and postscutellum gently tumid, with a few fine, scattered setigerous acupunctures. Mesopleura nitidous save for fine scattered setigerous acupunctures; episternal suture impressed, foveate; with vestiges of a fine short carinule running forward from just above middle coxal articulation but without tubercle or spine. Metapleura glabrous, polite. Propodeum perfulgid; dorsal and posterior faces glabrous, posterior face with a thin vestiture of erect silvery hair; dorsal face with barest vestiges of an impression delimiting a trigonal enclosure, polite, bisected by a narrow submarginate furrow which terminates in the broad and deep immarginate groove bisecting posterior face; lateral faces polite.

Legs simple; sparsely clad with shaggy silvery hair, none of the tibiae spinose, but with long declivent silvery setulae or bristles particularly on outer faces; tarsi hairy. Longer hind tibial calcar subequal in length to hind metatarsus.

Abdomen fulgid; petiole and second tergite glabrous save for a few scattered erect hairs. Second sternite discally and apical margins of following sternites with erect hairs. Third to sixth segments impunctate, with a thin vestiture of decumbent light hair; last segment conical, without a pygidial area.

*Male*.—Unknown.

This interesting Solomon Islands form is known only from the unique female described above.

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### JOHN DINWIDDIE MAPLE III

John Dinwiddie Maple III, Lieutenant (s. g.), U. S. Naval Reserve was killed in an airplane crash April 11, 1945, on the Island of Okinawa while observing the spraying of DDT from the air. While serving as an entomologist at the Bureau's laboratory at Orlando, Florida, prior to gaining his commission April 4, 1944, he was closely associated with the development of DDT for the control of malaria-carrying mosquitoes. His paper, "The Larvicidal Action of DDT on *Anopheles quadrimaculatus*" (Jour. Econ. Ent. 38 (4): 437-439) which appeared posthumously, has received considerable comment both in popular and scientific fields. Lt. Maple began his career with the Bureau of Entomology and Plant Quarantine in March, 1938.

From 1938 he served in the Foreign Parasite Division in Japan and was interned in that country at the beginning of World War II. He was included in the first exchange of prisoners and returned to the United States on the Gripsholm's first trip in June 1942. He was soon detailed to the Orlando, Fla., laboratory of the Bureau where he remained until receiving his commission in the Navy.

H. H. STAGE.

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